

Amendment under 37 C.F.R. §1.111
Application No. 10/721,080
Attorney Docket No. 032117

REMARKS

Claims 15-19 and 25-26 are pending. Claim 25 has been amended herein. Support for the amendment is found at page 11, lines 3-14 of the current specification.

Applicants Response to the Rejection under 35 U.S.C. §103(a)

Claim 25 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ahn Dong Hul (Japan Publication No. 2002-203895). In response thereto, applicants have amended claim 25 to more distinctly claim the subject matter regarded as the invention. Specifically, applicants have clarified within claim 25 that the silicon nitride liner has a tensile stress. Applicants respectfully submit that Ahn Dong Hul does not teach or suggest a silicon nitride liner with tensile stress retracted below the substrate by 80nm to 150nm, nor the results obtained by this feature of the current invention. The Office admits that the retracted depth of 80-150nm is not taught by Ahn Dong Hul, but maintains that the retracted depth of the SiN film is not critical. Specifically, the Office states that because of the benefit of having a large drain current, other factors such as thickness of the SiN film, gate voltage and drain voltage must be taken into account.

However, a silicon nitride liner having a tensile stress and retracted in trench isolation has the benefit of an increased drain current, Id. As noted in the current specification at page 11, lines 2-14, the silicon nitride film is formed by LPCVD or thermal CVD to result in a SiN film with a tensile stress. One of skill in the art may understand that the mobility of electrons increases with the magnitude of tensile stress. Hence, the skilled artisan would expect the retracted SiN stress liner to exhibit less stress, and therefore, reduce the drain current. However,

applicants have discovered that when a SiN liner is retracted in the trench to between 80nm to 150nm, the increase in drain current peaks. See page 9, lines 2-12 of the specification and Fig. 1A.

Hul does not teach nor suggest that drain current I_d maybe increased by a set recess amount of the SiN liner, and hence it is not obvious to the skilled artisan to optimize the recess amount. Under U.S. patent law, in order for the Office to maintain a *prima facie* case of obviousness based on an optimization of a range, the particular parameter must first be recognized as a result-effective variable before the variable might be characterized as routine experimentation. See M.P.E.P. § 2144.05 II.B. In other words, the surprising result is that the recess amount r of the SiN film affects the drain current of a device. Since this is not disclosed in the prior art, one of skill in the art would not know to adjust (optimize) the recess amount to obtain better drain current.

In view of the aforementioned amendments and accompanying remarks, Applicants submit that that the claims, as herein amended, are in condition for allowance. Applicants request such action at an early date.

If the Examiner believes that this application is not now in condition for allowance, the Examiner is requested to contact Applicants' undersigned attorney to arrange for an interview to expedite the disposition of this case.

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If this paper is not timely filed, Applicants respectfully petition for an appropriate extension of time. The fees for such an extension or any other fees that may be due with respect to this paper may be charged to Deposit Account No. 50-2866.

Respectfully submitted,

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A handwritten signature in black ink, appearing to read "Michael J. Caridi", is written over the printed name.

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